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May 17th 1958

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(*Vet. Rec.*, 1957, 69, 304.)

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(*Can. Jnl. Comp. Med. and Vet. Science*, 1957, 21, (5), 165.)

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Fenestration of the Aortic and Pulmonary Semilunar Valves in the Horse

BY

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SUMMARY.—Fenestration of the free edge of the cusps of the aortic and pulmonary semilunar valves appears to be a common feature of these structures in the horse. It has been found in various age groups and since these include the foetus and newborn it must sometimes be a developmental characteristic. However, the peripheral portion of the cusp, especially in the aortic valve, is always very delicate as compared with the deeper part and perforation in a purely mechanical way can probably arise easily.

Unless the fenestrations are very extensive and occur well in from the line of closure they seem unlikely to be of clinical significance.

CLINICIANS in Thoroughbred practice seem to have been paying increasing attention to the equine heart in recent years although as long ago as 1894 Stockman (*loc. cit.*) discussed anatomical changes, auscultation, percussion, murmurs and valvular incompetence in a paper entitled "Contribution to the Study of Heart Disease in the Horse." For insurance purposes, and in association with many private sales, attention to these aspects of cardiology forms an essential part of a competent examination for soundness to-day.

As a diagnostic aid electrocardiography has been used more and more during the last 10 years. Lannek & Rutqvist (1951) have reviewed developments in this field and Miller & Hickman (1952) described its use in England. Although the latter were of the opinion that organic changes in the horse's heart are not common "whereas functional changes and irregularities are not at all uncommon, particularly in race-horses and hunters," for various reasons it has rarely been possible to follow up abnormal electro-cardiographic tracings with exhaustive morphological examination of the heart. This is obviously essential if real progress is to be made in understanding equine cardiac disease and dysfunction for, at the present time, a great deal is either theoretical or borrowed from findings in the human subject. As an example, there are accounts in some veterinary text-books, often in considerable detail, concerning valvular incompetence and qualitative differences between various adventitious heart sounds. Upon the basis of these different murmurs many deductions are made but they are infrequently supported by details of evidence accumulated at subsequent *post-mortem* examinations. To interpret the latter satisfactorily a very close acquaintance with the normal heart is, of course, essential.

In this paper we are presenting certain data which indicate that even some of the grosser macroscopic features of the equine heart have still not been recorded. This being so, it is necessary to proceed with some care when relating various clinical data to a finding after the death of the animal.

Original Case

Recently we had occasion to perform an autopsy on a 3-year-old Thoroughbred colt. As a 2-year-old it had shown great promise, then suddenly lost form and finished in a distressed condition at the rear of the field. A clinical examination revealed various abnormal features in the heart sounds and action and subsequently these persisted in varying degrees for several months while the horse was resting.

Following a decision by the owner the animal was destroyed. The only *post-mortem* findings of interest were in the aortic semilunar valves whose free borders were extensively fenestrated (Plate A 13). There were no inflammatory or other lesions and the perforated cusps impressed one at first as a likely source of "insufficiency of the aortic semilunar valves" and as an explanation of the murmurs which had been reported.

Despite the frequency with which aortic, and valvular incompetence generally are described, we were able to find very few references to definite lesions. Stockman (*loc. cit.*) wrote "I have met with aortic incompetence most commonly in well-bred horses of uncertain age. It appears to be fairly common but I have *post-mortem* notes of only 2 cases. One of these showed rupture of a semilunar cusp parallel to its free border . . ." This is the only reference to fenestration we have found and since neither Sisson (1938) nor Bradley (1946) mention it, even in a footnote, we presumed it uncommon and outside the limits of normal structure.

Results of *Post-mortem* Examinations

Nevertheless, it was decided to examine the valves carefully in a consecutive series of *post-mortem* examinations in horses of various ages, with a view to learning something of the genesis of the lesion. We were surprised to find that 22 of 27 animals of various ages, from an 8-month foetus to a 22-year-old stallion, showed some degree of fenestration of the cusps of one or both sets of semilunar valves. These facts are set out in some detail in Table I; where an asterisk appears beside the number of the horse a photograph of the cusps is presented (Plate A). In no case did either ventricle appear hypertrophied or otherwise abnormal and cardiac disease or dysfunction had never been suspected in any of them.

Discussion of Anatomy and Physiology

After a consideration of this series we strongly suspect that some degree of fenestration is so common as to be virtually a normal characteristic of these valves in the horse and unless of much greater extent than we have seen yet the mere presence of perforations along the free edge can hardly be a cause of valvular incompetence.

In the case of the aortic valves, at least the first 5 mm. width from the free edge inwards is always quite delicate in appearance and gives the impression of being very prone to fenestration. There are a series of bands of relatively dense connective tissue extending across the greater width of the cusps. Some of the more peripheral ones tend to arborise. The most peripheral band, which actually constitutes the free concave edge of the cusp, is appreciably thinner than the deeper ones. It joins a central nodule which is a conspicuous feature of the aortic semilunar cusps. The latter take on an appreciably thicker and stronger appearance in their inner two-thirds, towards the attached border (Fig. 1, A.).

The pulmonary valves are thinner and rather more homogeneous than the aortics. In the adult the central nodule is either absent or inconspicuous although in the foetus we have frequently noticed it to be as well developed as in the corresponding aortic cusps.

Fenestrations are always along the delicate free edge and although some are undoubtedly developmental, because of their presence in the foetus, stillborn and newborn, it is easy to imagine that others might arise in such thin tissue purely as a result of continued activity. Some can be provoked fairly easily by injudicious handling at *post-mortem* examination when they appear just like those occurring spontaneously—various sized apertures with minute cross strands. At the beginning of our investigation we noticed the possibility of provoking fenestrations during our manipulation of the valves. As a result we have always taken stringent precautions to assure that we did not do this inadvertently. Generally the aorta or pulmonary artery was slit open by cutting towards the heart and great care was taken at the valves to cut between two cusps. These were always handled with extreme care. Often a very gentle flow of water was allowed to run between the cusp and the vessel wall and in this way it was generally easy to study the structure of the periphery before even handling the cusp. With some of the larger adult hearts we made a transverse cut through the arteries about 1 cm. above the level of the valves. Then a finger was placed very carefully under the cusp at each edge just where it joined a fellow cusp. Only sufficient tension was used to provide a mere peep and then a little more was exerted to give a somewhat clearer view of the periphery. Following this, or sometimes before, a gentle stream of water was allowed to flow into the auricle, thence to the ventricle and so up past the valves. In good light this provided an excellent view of the cusps. In most of the cases recorded in this paper a second observer was present to verify that an artefact had not been created. A semi-diagrammatic representation of the development of fenestration is presented in Fig. 1.

If a dissected heart in which the aorta and pulmonary artery are cut a little above the valves is placed in a conical funnel and water run through the posterior vena cava or into the left auricle, sufficient can be seen, even by so crude a technique, to explain why quite a marked degree of fenestration need not necessarily lead to "leakage." When the valves are closed the perforations in the cusps very rarely coincide, there is considerable overlap of the free edges which hang loosely over and along one another (Plate B 2) and it is even possible that this is facilitated by the peripheral margins being thinner than the deeper portions of the cusps. It seems most unlikely that closure of the valve *in vivo* occurs by mere edge to edge apposition in the manner illustrated in Plate B 1.

Other Species

We have not found reference to fenestration of the valves in other domestic species and there is relatively little concerning such cases in medical literature. Foxe (1929) noted the paucity of literature on the subject. He studied 300 human hearts and found

TABLE I

Horse	Age	Breed	History	Pulmonary Semilunars	Aortic Semilunars
1	8 month foetus	Thoroughbred	Aborted—unknown cause	Minute fenestrations along free edge of posterior cusp	No fenestration.
2*	Full term foetus	Thoroughbred	Stillborn	No fenestrations	Minute fenestrations along the free edge of the medial posterior cusp. Plate A 2.
3*	Full term foetus	Suffolk punch	Stillborn	No fenestrations	Three minute fenestrations along the free edge of the anterior, 3 along the edge of the lateral posterior and one along the edge of the medial posterior cusp. Plate A 3.
4	Newborn foal	Thoroughbred	Only lived a few minutes	No fenestrations	Minute fenestrations along free edge of lateral posterior cusp.
5*	Foal 24 hours	Thoroughbred	Died. Coliform bacteraemia	Tiny fenestrations along free edge of each cusp	Tiny fenestrations along free edge of each cusp. Plate A 5.
6	Foal 24 hours	Thoroughbred	Destroyed—deformed limbs	Fenestrations of from 1 to 2 mm. diameter along the free edge of each cusp	Minute fenestrations along free edge of anterior and lateral posterior cusps
7	Foal 24 hours	Thoroughbred	Died *Bact. viscosum equi* infection	Minute fenestration along free edge of lateral anterior cusp	Minute fenestration along free edge of anterior cusp.
8	3 weeks	Thoroughbred	Destroyed—broken sesamoids	Nine tiny fenestrations along the free edge of the posterior cusp	An elongated fenestration ca. 4 mm. by 1 mm., with delicate cross strands, along the free edge of the anterior cusp and 2 tiny fenestrations along the free edge of the medial posterior cusp.
9	3 weeks	Thoroughbred	Died with pulmonary lesions	Four fenestrations 1 and 2 mm. diameter along free edge of posterior cusp	Seven fenestrations of from 1 to 2.5 mm. diameter along free edge of right posterior cusp.
10	6 weeks	Thoroughbred	Died—tetanus	A series of minute fenestrations along free edge of posterior cusp	A series of minute fenestrations along free edge of each cusp.
11	2 years	Thoroughbred	Destroyed following accident	No abnormality	Two caseous nodules near the attached border and 1 fenestration ca. 5 mm. by 2 mm. with delicate cross strands along the free edge of the anterior cusp.
12	2 years	Thoroughbred	Destroyed—ataxia	No abnormality	Small fenestrations (ca. 1 mm. diameter) along the free edge of the anterior cusp.
13*	3 years	Thoroughbred	Destroyed—considered an indifferent racehorse	No abnormality	Extensive fenestration along the free edge of each cusp. Plate A 13.
14*	4 years	Hunter	Unbroken—died of impaction	Two fenestrations each of about 1 mm. diameter along free edge of anterior medial cusp and two similar fenestrations in posterior cusp	Numerous small fenestrations 1 to 2 mm. diameter along the free edge of all cusps. Some nodules on each cusp in varying positions but not always in close proximity to the fenestrations. Plate A 14
15	5 years	Thoroughbred	Died following injuries	No abnormality	Well marked fenestrations along the free edge of the posterior medial cusp and two small fenestrations on the anterior cusp.
16	7 years	Hunter	Died following operation for severed tendons	No fenestrations	Five fenestrations of from 1 to 2 mm. diameter along the free edge of the anterior cusp and two similar ones on the posterior medial cusp.
17	10 years	Thoroughbred	Died of anaerobic infection following operation for recto-vaginal fistula	Anterior lateral cusp with one 1 mm. fenestration on free edge	Extensive fenestration along the free edge of the anterior and posterior lateral cusps.
18*	12 years	Thoroughbred	Died following obscure gastro-intestinal disease	1 mm. diameter fenestrations along free edge of all cusps	Extensive fenestrations 1 to 3 mm. diameter with numerous cross strands along the free edge of all cusps. Plate A 18.

TABLE I—*Continued*

Horse	Age	Breed	History	Pulmonary Semilunars	Aortic Semilunars
19	15 years	Hunter	Died—intestinal disease	Two fenestrations of ca. 1 mm. diameter along free edge of anterior lateral and similar fenestration of anterior medical cusp	Several fenestrations each about 1 mm. diameter along the free edge of each cusp.
20*	16 years	Thoroughbred	Brood mare—died following a train journey from Milan to Newmarket	Four cusps present. Each extensively fenestrated with numerous cross strands along the free edge. Plate A. 20	Several fenestrations 1 mm. diameter along the free edge of each cusp. Plate A 20.
21*	4 years	Thoroughbred	A first class racehorse—death due to misadventure	Minute fenestrations along the free edge of each cusp	Well marked fenestration along the free edge of each cusp, particularly on the right posterior. Plate A 21.
22	22 years	Thoroughbred	"Nearco"—a famous stallion. Destroyed following neoplasia	No fenestration	Several 1 mm. fenestrations along the free edge of left posterior cusp and rather larger ones along the right posterior.

one or more fenestrations in 82 per cent. of cases: there was a negligible difference in frequency as between the aortic and pulmonary valves, the incidence increased with age and it was considered to be a pathology fundamentally mechanical in origin and of little or no clinical significance. Unlike our cases in the equine foetus he found none in the human foetus and thought therefore that there was no proof that the defects were developmental.

Castleman & Towne (1951) reported a case of a patient who died under anaesthesia having aortic cusps "full of holes," the heart was "tremendous" at *post-mortem* examination, there was hypertrophy and marked dilatation of the left side. The fenestrations involved all three cusps and extended below the line of closure. The author noted that fenestrations are often seen "normally" in aortic cusps, usually along the edge. There is rarely any sign of aortic insufficiency in such people.

Conclusions

Our series is too small to draw conclusions as to whether the incidence of fenestration in the horse increases with age. It shows that the condition may be developmental in some cases but whereas it is not invariably present in the foetus it so happens that all horses aged 2 years or more upon which we have performed an autopsy since we commenced the observations have had some degree of fenestration. The aortic valves have been the more frequently involved but some striking cases have been seen in the pulmonary semilunars (Plate A 20).

It is tempting to speculate upon some possible correlation in racing ability and the degree of fenestration in race-horses but recently we performed an autopsy on Nearco, a famous stallion, and he had small perforations in two aortic cusps. Further, we have already seen considerable perforation along the free edges of the valves of a high class performer (Plate A 21). We feel it reasonable to conclude that dysfunction is only likely when the fenestrations extend well down into the bodies of the cusps and away from the line of overlap. This might be tested at *post-mortem* examination whilst the valves are still intact, but we have not seen such a degree of fenestration in any of our cases.

The cause of the embarrassment and cardiac abnormalities noted clinically in the original case remains obscure.

Acknowledgments.—I should like to express my thanks to Dr. R. Archer for the photography.

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PLEA FOR PUMAS

A letter was received by a certain zoo which read as follows:—

"Dear Sir,

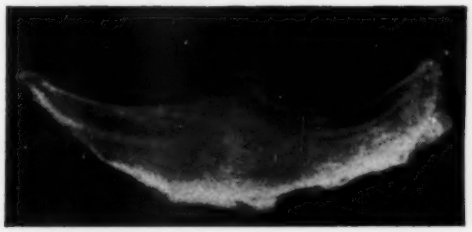
Will you be so kindly and to say for me, when you have until 3-4 pumas, masc, 4-10 months to sell.

I would have a great interest for it. Please give me the conditions etc.

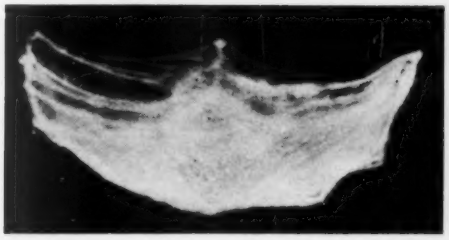
With my best salutations."

The person in charge of the appropriate department was instructed by the administration of the zoo to write back to the correspondent, stating, "Please to say for him what have not we."

LEO W. MAHAFFEY.—FENESTRATION OF THE AORTIC AND PULMONARY SEMILUNAR VALVES IN THE HORSE



13. Three-year-old Thoroughbred. Anterior aortic semilunar cusp.



13. Three-year-old Thoroughbred. Right posterior aortic semilunar cusp.

2. Full-term foetus. Aortic cusp.

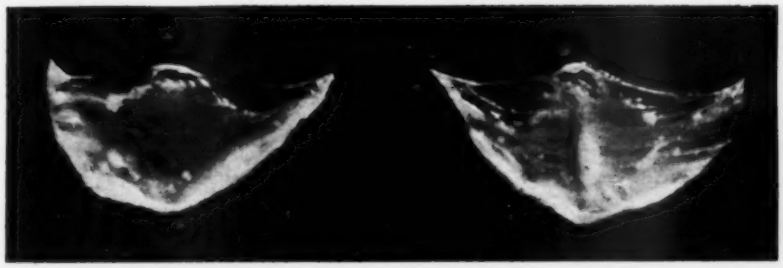
3. Full-term foetus. Aortic cusp.

5. 24-hour-old foal. Aortic cusp.

14. Four-year-old unbroken hunter. Aortic cusp.

18. 12-year-old Thoroughbred. Aortic cusp.

20. 16-year-old Thoroughbred. Aortic semilunar cusp.



20. 16-year-old Thoroughbred. Pulmonary semilunar cusps.

21. Four-year-old Thoroughbred. Aortic semilunar cusp.

PLATE A.—Numbers correspond to horses in Table I.

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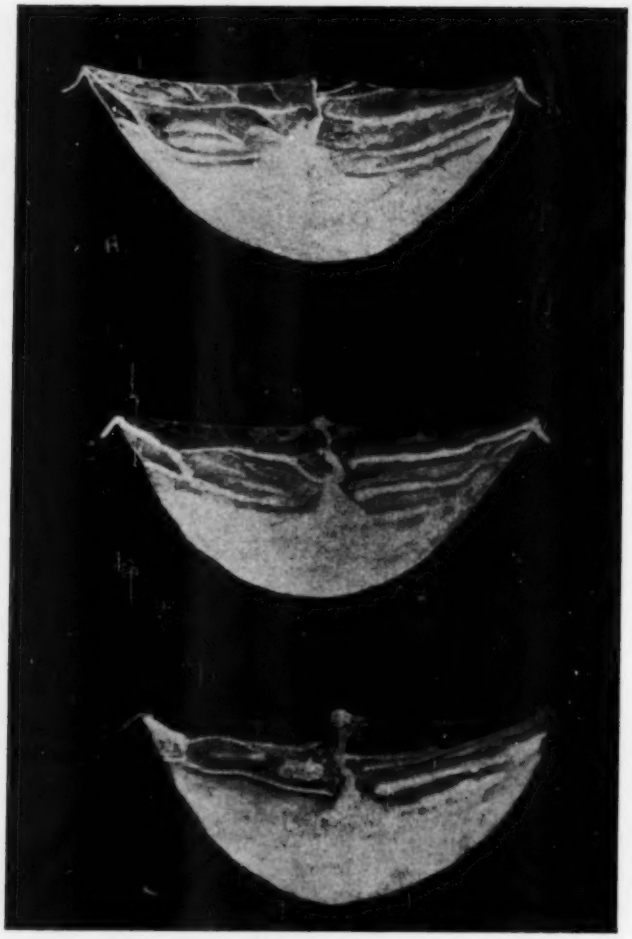
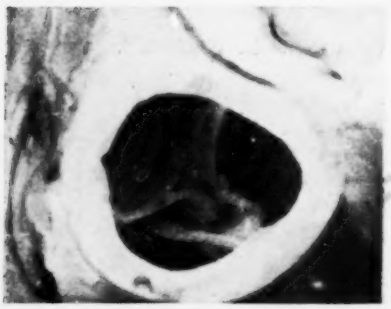


FIG. 1.—Is semi-diagrammatic and was drawn to show (A)—The thinness of the peripheral portion of the aortic cusp as compared with the deeper half towards the attached border. (B)—The mechanical "breakdown" of portions of the delicate free edge with the development of fenestration. Sometimes a lesser degree of this is seen in the foetus and is developmental. (C)—More extensive fenestration. We have never seen any "reaction" to the fenestration —neither inflammatory response nor attempts at repair.

PLATE B.

1. The usual text-book presentation of the aortic and semilunar valves (after Bradley). If the closure takes place as suggested in this diagram, fenestration along the free edge could conceivably lead easily to "leakage." However, we believe that although this may be a good schematic representation of the morphology of the valves it is likely to lead to physiological and pathological misconceptions.



2. Photograph of aortic semilunar valves showing a more likely *in vivo* method of closure.

Brucella Infection in the Dairy Herds of Northern Scotland

BY

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SUMMARY.—An investigation during the years 1954-5-6 *showed that* 25 *per cent. of the dairy herds in the Northern counties of Scotland gave a positive M.R.T.* Brucella abortus *was recovered from approximately* 25 *per cent. of the M.R.T. positive bulk milk samples.*

Examination of individual animals by means of agglutination tests made on the serum and vaginal mucus, milk ring tests and milk cultures showed that a high proportion of the cows with positive M.R.T. and positive vaginal mucus tests were excreting brucella in their milk.

Strain 19 *vaccination did not appreciably affect the results of milk ring testing.*

Introduction

SEVERAL countries are at present engaged in eradicating Brucella infection from their cattle populations. A study of the measures they have taken shows that there is no simple universally applicable method for the eradication of this disease (Nielson, 1955; Mitchell, 1955; Mingle, 1955). Eradication, however, would seem to be the ultimate goal for all cattle breeding countries. It appeared to us that in Great Britain any eradication scheme would necessarily be organised on an area basis and that area information on bovine brucellosis would be useful.

In many countries *Brucella abortus* infection in cattle is known to be widespread, but the actual number of cattle infected is hard to assess accurately, mainly because of the difficulty in diagnosis. The milk ring test introduced by Fleischhauer (1937) and subsequently studied by Bruhn (1948), de Moulin (1951) and many others, has been established as a competent screening test for detecting herds possibly infected with Brucella. Mingle (1955) reports that the milk ring test detects around 90 per cent. of the herds in which one or more Brucella infected animals are in production. Driver and Roepke (1951) consider that 3 tests will serve to locate 85 per cent. of newly infected herds. The milk ring test has been widely used in Denmark and the United States of America as a screening test in their brucellosis eradication schemes.

The recovery of *Brucella abortus* from milk has always presented difficulties and the conventional use of guinea-pig inoculation for this purpose has been reported to be a comparatively insensitive method (Smith, 1932; Doyle, 1935). The development of media such as described by Mair (1955) has made the isolation of *Brucella abortus* by direct culture more practicable. The diagnosis of latent brucellosis in the bovine when udder infection is absent is a difficult problem. This has focused attention on the levels of antibodies against *Brucella abortus* in serum. However, the widespread use of the agglutinogenic Strain 19 vaccine in both immature and adult cattle has added to the difficulty of interpreting serological results. Thus serum titres alone may not always be sufficient to enable a diagnosis to be made. The detection of local antibody as distinct from serum antibody as a diagnostic guide has been used in a number of diseases. Antibody to *Brucella abortus* has been detected in vaginal mucus and its usefulness in the diagnosis of brucellosis in cattle has been claimed by Jepson and Vindekilde (1951) and Kerr (1955).

The present paper describes the use of the above methods of diagnosis in dairy herds in the North of Scotland and the results obtained have been correlated with vaccination histories supplied by veterinary surgeons practising in the area.

Material and Methods

Milk Ring Test

Samples of bulk milk from dairy herds in the counties of Caithness, Sutherland, Ross and Cromarty and Inverness are received by the Bacteriology Laboratory at Raigmore Hospital, Inverness for routine bacteriological testing and for guinea-pig inoculation to exclude tuberculosis infection. The milk ring test was carred out on these samples regularly in 1954, 1955 and 1956. The milk samples were all tested as soon as possible, usually less than 24 hours after collection. Whenever it was necessary to store them for a few hours they were put in the refrigerator at 4° C. No preservatives were added and dilution techniques were not adopted.

Milk samples from individual cows were also examined by the ring test. For this purpose a sample of milk was collected from the milking bucket of each cow immediately after the milking machine had been removed. These collections took place at the afternoon milking. The samples were put into 1 oz. screw capped bottles without preservative. They were kept in a refrigerator at 4° C. overnight and tested the following morning.

Haematoxylin stained antigen was obtained from the Ministry of Agriculture, Fisheries and Food, Veterinary Laboratory, Weybridge and the technique used was that recommended by Weybridge: 1 ml. of milk was placed in a narrow test tube so that it formed a column about 2 cm. high, 1 drop of stained

* Now at the Royal (Dick) School of Veterinary Studies, Edinburgh.

antigen was added and the tube gently inverted several times so that the colour was uniformly mixed. The tubes were then placed in a water bath at 37° C. for half an hour.

Results were classified:—

Negative.—Milk column blue and the cream white or only slightly blue.

±.—Both milk and cream the same colour or the cream only slightly darker.

+.—Both coloured but the cream definitely more blue.

++.—Milk slightly blue and the cream definitely blue.

+++.—Milk white and the cream definitely blue.

Readings of ± and above were taken as indicating the presence of Brucella antibody in the milk.

Biological Test

From June, 1954 to March, 1956, 470 milks were submitted for biological examination for tuberculosis. The centrifuged deposit from 100 ml. of each sample plus two loopfuls of the cream were mixed with 2 ml. of saline and each of a pair of guinea-pigs was then inoculated subcutaneously with 1 ml. of this mixture. Eight weeks later the guinea-pigs were killed and the serum from each pair bulked and examined for brucella agglutinins, the minimum dilution set up being 1:10. The antigen was supplied by the Standards Laboratory*. The spleens were removed intact, macerated and cultured on tryptose agar for 7 days in the presence of 10 per cent. carbon dioxide.

Cultural Test

During 1955 and 1956, direct culture of herd milk samples was made. The medium used was a 2 per cent. Difco tryptose agar containing penicillin 50 units per ml., polymixin B. 6 units per ml., actidione 100 micro gm. per ml. and gentian violet 1:250,000. Two large loopfuls of cream were cultured on well-dried plates which were incubated for seven days at 37° C. in an atmosphere containing 10 per cent. carbon dioxide. Strain 19 grows on this medium without added carbon dioxide.

Mucus Agglutination Test

Vaginal mucus was obtained by inserting a small swab of ordinary sponge approximately 1 in. x ½ in. x ½ in. secured on a piece of smooth string through a vaginal speculum which was made from a 6-inch length of 1-inch diameter copper tubing.

A fresh sterilised speculum was used for each cow. Preliminary experiments showed that such a swab normally absorbed about 1 ml. of secretion when left in place for about one hour. The swab was placed in the vagina so that it was 2 to 3 inches anterior to the external urethral orifice. The string attached to each swab was sufficiently long for the end to be easily picked up at the vulva when the swab was in position. After an hour it was removed and put at once into a bottle containing 4 ml. of normal saline to give a primary mucus dilution of 1:5. The method of collecting mucus is based on that described by Jepson and Vindekilde (1951).

Antigen obtained from the Veterinary Laboratory, Weybridge, was used for the agglutination tests which were made on the vaginal mucus samples. Doubling dilutions of the mucus ranging from 1:5 to 1:40 were set up in agglutination tubes using normal saline as a diluent. With the addition of an equal volume of antigen to each tube the final dilutions became 1:10 to 1:80. The tubes were incubated for 20 to 24 hours at a temperature of 37° C. Readings of 1:10++ (50 per cent. agglutination) and over were regarded as indicating probable antibody against brucella.

Serum Agglutination Test

Blood for the serum agglutination test was withdrawn from the jugular vein when the vaginal mucus and individual milk samples were being collected. When the blood had clotted the serum was used to make serial dilutions with normal saline which, when the antigen had been added, ranged from 1:10 to 1:80. After 20 to 24 hours incubation at 37° C. the tubes were examined in daylight against a dark background and the serum titres noted. When a serum gave complete agglutination at 1:80, further series of dilutions were set up until the end point was found. For the purposes of Table V, titres of 1:20++ and above were taken to be positive.

Results

The number of dairy cows in milk in June, 1955 and, therefore, approximately the number of animals concerned in this survey is shown in Table I.

TABLE I
THE DISTRIBUTION OF DAIRY COWS IN THE NORTH OF SCOTLAND

County	Number of dairy cows in milk
Inverness	7,373
Ross	5,826
Caithness	2,591
Sutherland	1,677

*Figures at June, 1955. From the Agricultural Statistics, Department of Agriculture for Scotland.

From 1954 to 1956 milk ring tests were made on 1,825 bulk milk samples and the results shown in Table II indicate that over the 3-year period of the survey the approximate percentage of herds giving positive ring tests was 25 per cent. The number of ring tests made on the milk from each herd varied, the majority were tested twice in every year, many were examined three times or more.

Before the ring test examination of bulk milks was started, 245 samples had been inoculated into guinea-pigs. Of the 1,825 herd samples tested by the milk ring tests 225 were examined biologically. Twenty-eight of this total of 470 samples gave positive results, the organism being isolated on 20

*The Standards Laboratory for Serological Reagents, Central Public Health Laboratory, Colindale Avenue, London, N.W.9.

TABLE II

MILK RING TESTS FOR BRUCELLOSIS, 1954-6

County	1954			1955			1956		
	Total herds	Number positive	Percentage	Total herds	Number positive	Percentage	Total herds	Number positive	Percentage
Inverness	123	24	19·5	105	21	20	110	21	19
Ross	42	14	33	40	12	30	40	10	25
Caithness	74	24	33	80	22	28·5	78	20	26
Sutherland	27	10	37	28	8	28·5	23	5	22
Total for Area	266	82	28	253	63	25	251	56	22

Total number of samples ring tested 1954-6 = 1,825.

occasions and antibody in guinea-pig serum being detected in a further 8. If these milks inoculated into guinea-pigs are regarded as representative it would indicate that in this area where 25 per cent. of the herds gave a positive milk ring test, proof of infection, as judged by guinea-pig inoculation, is obtainable in about 6 per cent.

Bulk milk samples from a total number of 504 herds were examined by the milk ring test during 1955 and 1956. Direct cultures were made from the milk ring test positive herd milks in 1955 and all the herd milks in 1956 making a total of 444 samples cultured. Bulk milk samples from 29 herds yielded *Brucella abortus*. This gives an isolation rate by direct culture of 5.75 per cent. which is comparable with the recovery rate achieved by guinea-pig inoculation; proof of infection is obtained in less than a quarter of the number of the herds showing a positive milk ring test.

Table III shows the correlation of the milk ring test and isolation of *Brucella abortus* by guinea-pig inoculation in the 225 samples where the milk ring test result was available. Table IV shows the relationship of the milk ring test and direct culture.

TABLE III

THE CORRELATION OF THE M.R.T. AND ISOLATION OF BRUCELLA BY GUINEA-PIG INOCULATION ON 225 SAMPLES OF HERD MILKS

M.R.T.	Number of samples	Serum antibody in g.-pig. Brucella not isolated	Brucella isolated
Negative	176	Nil	Nil
±	11	Nil	Nil
+	17	1	3
++	19	1	7
+++	2	1	Nil

TABLE IV

THE CORRELATION OF THE M.R.T. AND ISOLATION OF BRUCELLA BY DIRECT CULTURE OF 444 SAMPLES OF HERD MILKS

M.R.T.	Number of samples	Brucella isolated
Negative	287	Nil
±	27	6
+	40	6
++	66	17
+++	24	11

Although the milk ring test has been of great value in the detection of herds potentially infected with Brucella its use diagnostically in the individual animal is less satisfactory for a number of reasons. Therefore in the investigation of individual animals we used serum agglutination, vaginal mucus agglutination and milk culture in addition to the milk ring test. We examined 483 animals from 17 herds on this basis and the results are shown in Table V.

TABLE V

MILK, SERUM AND VAGINAL MUCUS ANTIBODY IN RELATION TO *Brucella abortus* ISOLATION FROM MILK IN INDIVIDUAL ANIMALS

M.R.T.	Serum titre	Vaginal mucus titre	Number of animals	Isolation of Brucella from milk
+	+	+	35	18
+	+	−	32	2
+	−	+	1	Nil
+	−	−	14	1
−	+	−	80	Nil
−	−	+	6	Nil
−	+	+	14	Nil
−	−	−	181	Nil
Dry	+	+	19	2
Dry	+	−	49	Nil
Dry	−	+	0	Nil
Dry	−	−	52	Nil

M.R.T. + = ± and above. Serum + = 1·20 ++ and over. Vaginal mucus + = 1·10 ++ and over.

It can be seen from Table V that where the three tests are positive the isolation rate from the milk is 54 per cent. It is well known that adult vaccination gives rise to a persistent serum titre high enough to be regarded as positive, and for this reason Table VI has

TABLE VI

M.R.T. AND VAGINAL MUCUS ANTIBODY IN RELATION TO *Brucella abortus* ISOLATION FROM MILK IN INDIVIDUAL ANIMALS

M.R.T. titre	Vaginal mucus titre	Number of animals	Isolation of Brucella from milk
+	+	36	18
+	−	46	3
−	+	20	0
−	−	261	0

XUM

been compiled where the serum titre has been disregarded and only the milk ring test and the vaginal mucus agglutination results recorded. It is evident there that these two tests are almost as good as the three tests for indicating potentially infected animals.

As a means of diagnosing infection, judged by the recovery of *Brucella abortus* from the milk, the milk ring test itself is no more accurate than the vaginal mucus test alone, 21 isolations out of 82 milk ring test positives compared with 20 isolations out of 75 vaginal mucus agglutination positives. Separately they are markedly less efficent than when used together. Of the 483 animals examined, *Brucella abortus* was isolated from milk in 23; 4 of these animals had serum titres of 1:40+ and below, the remaining 19 had titres of 1:40++ and above.

Examination of Brucella Strains

During the period 1954 to 1956, 78 strains of Brucella were isolated. These were examined for dye sensitivity, hydrogen sulphide production, carbon dioxide requirement and reaction with monospecific serum. Seventy-four strains were typical of *Brucella abortus*, 4 strains while having the dye sensitivity pattern of abortus strains were CO_2 independent and reacted serologically like *Brucella melitensis*. None of the strains isolated was typical of Strain 19 as judged by carbon dioxide independence and thionin blue sensitivity (MacLeod, 1944; Levine and Wilson, 1949).

Strain 19 Vaccination and the Milk Ring Test

In the latter part of the year preceding the survey and while it was actually in progress, adult vaccination was carried out in 17 herds. In 4 the bulk milk ring test remained negative and in another 4 only a transitory ± reaction appeared. Three other milk ring test reactions showed changes which might have been caused by the use of S.19, one milk ring test which had been + became ++, one negative milk ring test became ++ but was still ++ the following year so infection may have been responsible; the third herd milk which gave ± and − reactions in 1954 became ++ in 1955 after vaccination and was negative in 1956.

On 120 farms in the survey the young stock were regularly vaccinated. In this instance the term young stock includes heifers at the time of first service as well as calves. In 79 of these farms the bulk milk ring test has been consistently negative.

Thus it would seem that Strain 19 vaccination even in adults does not necessarily interfere significantly with the result of a milk ring test made on the bulk milk.

In order to get more information on the effects of vaccination of adult cattle in Brucella-free herds, 8 cows in such a herd were inoculated with Strain 19. The herd was chosen because it had a history of freedom from abortion, repeated bulk milk ring tests had been negative, the milk ring test and vaginal mucus agglutination tests on the individual cows were negative and serum titres were all 1:20+ or below except for two animals which had been vaccinated as heifers; these had a titre of 1:20++. Table VII shows the results. The vaginal mucus agglutination titres show some disturbance but they appear to be returning to normal 15 weeks after vaccination. The milk ring test results are virtually unchanged. The cows used in this experiment were of varying ages. They were all non-pregnant, having been calved for periods ranging from 10 days up to 2 months.

Discussion

Taking both the bulk milk ring test results as a whole and the results from the individual counties, there is a small reduction in the number of milk ring test positive milks over the 3-year period. This may be accounted for by the fact that several small farms which consistently gave milk ring test positive milk ceased commercial production during this time. By and large, however, herd samples which gave a positive ring test continued to do so, and likewise very few bulk milk samples originally negative became positive. There was, therefore, little evidence of widespread fluctuation in the distribution of infection in the area.

The recovery of viable brucellae from approximately a quarter of the milk ring test positive herds is in keeping with the findings of similar investigations elsewhere, but the relatively low figure of 25 per cent. positive milk ring test milks is noteworthy, as is the fact that the recovery rate of Brucella on the medium employed was comparable with that obtained by animal inoculation. Since this was achieved by streaking two loopfuls of cream on to single plates there seems little doubt that the employment of more comprehensive techniques would have increased the number of isolations.

TABLE VII

EFFECTS OF VACCINATION WITH STRAIN 19 ON EIGHT ANIMALS FROM AN ABORTION FREE HERD

Cow No.	Before vaccination			3 weeks after			6 weeks after			15 weeks after		
	Serum	M.R.T.	V.M.	Serum	M.R.T.	V.M.	Serum	M.R.T.	V.M.	Serum	M.R.T.	V.M.
155	Neg.	Neg.	Neg.	1:320	Neg.	1:40++	1:40++	Neg.	Neg.	Not available		
236	1:20++	Neg.	Neg.	1:320	Neg.	1:200	1:160	Neg.	1:80	1:100	±	1:10+
247	Neg.	Neg.	Neg.	1:160	Neg.	1:20+	1:160	Neg.	Neg.	1:100	Neg.	1:10+
21089	Neg.	Neg.	Neg.	1:160	Neg.	1:20+	1:160	Neg.	Neg.	1:80++	Neg.	Neg.
30028	1:20++	Neg.	Neg.	1:160	Neg.	1:100	1:160	Neg.	1:40+++	1:80++	Neg.	1:20+
50001	Neg.	Neg.	Neg.	1:640	+	1:100	1:320	Neg.	1:20++	1:100	Neg.	1:20+
52530	1:20+	Neg.	Neg.	1:640	Neg.	1:10++	1:320	Neg.	Neg.	1:100	Neg.	1:10+
72321	Neg.	Dry	Neg.	1:320	Neg.	1:200	1:160	Neg.	Neg.	1:80++	Neg.	Neg.

In the tests done on the milk, serum and mucus from individual animals the antibody levels regarded as positive were deliberately set low. It was thought advisable to do this in order to try to exclude the possibility that a cow negative to these tests might be harbouring Brucella infection. Despite this handicap a high percentage of animals with positive milk ring tests and positive vaginal mucus tests were shown to be infected. This suggests that this would be a useful combination of tests to employ when it is desired to make a definite diagnosis in an individual animal and has the merit of being well within the compass of a small laboratory. In a Public Health enquiry, where Brucella infection has been found in the milk supply, the use of the milk ring test on the bulk milks would enable the potentially infected farms to be discovered and the vaginal mucus and milk ring tests would serve to indicate which cows in these herds are likely to be excreting Brucella organisms in their milk. In this respect the following may be of interest.

A youth was admitted to hospital in Inverness where, on clinical and serial serological examination, a diagnosis of brucellosis was made. Enquiries revealed that he consumed milk both at home and at school from a dairy which was supplied by 15 farms, 13 of which had over a period of 2 years consistently given negative bulk milk ring test results while one had shown an occasional weak positive and one a consistently strong positive result. Further investigation of these latter 2 farms showed that 4 animals had positive milk ring tests and 2 of these located on the farm with the strong positive bulk milk ring test had also positive vaginal mucus tests. Bacteriological examination of all the individual milks showed that only these 2 animals yielded positive cultures.

In view of the report by Ferguson and Robertson (1954) that 2 cows vaccinated with Strain 19 as adults had remained strong positive reactors to the ring test for about 9 months and in one case 2 years it was thought at the start of this investigation that Strain 19 vaccination might profoundly affect the results of the bulk milk ring test. With this in mind all veterinary surgeons practising in the area were asked to give as much information as possible on the vaccinations done in the dairy herds. The information which they supplied, correlated with our findings, together with the small scale experiment that we were able to do led us to the conclusion that vaccination, even of adults, did not appear to produce lasting effects on the bulk milk ring test. The findings of Ogonowski and McDiarmid (1954), who made a comprehensive study of *Brucella abortus* agglutinins in milk from individual animals, have confirmed that Strain 19 vaccination of cattle under breeding age has a negligible effect on the ring test reaction of their milk when they come into production.

On the evidence available we are inclined to the view that a consistently positive milk ring test in herd milk samples reflects infection in that herd and, therefore, in this area approximately one quarter of the dairy herds are carrying infection.

Acknowledgments.—We wish to thank all the farmers and veterinary surgeons who provided such excellent co-operation, often at considerable inconvenience to themselves.

We are indebted to Dr. A. W. Stableforth, Director of the Ministry of Agriculture, Fisheries and Food, Veterinary Laboratory, Weybridge, for supplies of antigen and vaccine.

We should also like to thank Miss Mary MacLean, N.D.D. and Mr. J. MacPherson, F.I.M.L.T., for their efficient technical assistance.

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FIFTY YEARS AGO

"Scotchmen" in Opposition

"For two or three years past, our (R.C.V.S.) Council elections have been devoid of acute political interest, and voters have been guided by their judgment of the general fitness for office of the candidates. To-day a test question is before the electors, and all other considerations must be subordinated to this. The Veterinary Surgeons' Bill will come before Parliament, and it is of the utmost importance that it should do so stamped with the approval of the great majority of the profession.

"Three of the candidates are avowed opponents of the Bill, and it is not a little unfortunate that all these should be Scotchmen. Scotchmen, for some years past, have expressed a desire to be more fully represented on the Council than they are now. This is a patriotic sentiment with which Englishmen will sympathise. Ireland is generally represented—not many years ago there were three Irish practitioners on the Council at one time—and there is no reason why Scotland should not be. We should all welcome a new Scotch member, provided that, on matters which concern the whole profession, he held opinions approved by the majority; but when important differences are to the fore, we cannot afford to let sentiment interfere with duty."

XUM

Thermo-Cautery in the Treatment of Excessive Granulation Following Corneal Ulceration

BY

D. G. LEWIS

Rochester

THE following technique is mentioned in American literature as a routine measure in small animals (Phillips & Magrane, 1952; Magrane, 1955). Its results can be so beneficial that it is repeated for the possible benefit of practitioners who may not have come across it.

A brief knowledge of the physiological basis makes the whole procedure more clearly understandable.

Physiology

In normal health the cornea is avascular and receives its nutrition from the peri-limbal plexus. In cases of injury or infection this is dealt with by an increased metabolism of the individual corneal cells plus an increased peri-limbal blood supply. If the eye is still unable to cope there is an invasion of blood vessels into the cornea and the invasion may be of two types:—

1. *Superficial*—tree-like in appearance. The vessels can be seen to arise from the peri-limbal plexus in the white of the sclera and to extend over the corneal-scleral junction into the cornea.
2. *Deep*—brush-like, arising from the ciliary vessels and appearing at the corneal margin.

In prolonged ulceration or injury superficial vascularisation may reach a point where it no longer helps but impedes repair, and the formation of exuberant granulation ("proud flesh") occurs as in many similar body lesions. There is the resultant area of red granulation over and around the original scar in the cornea. At any time up to this stage successful resolution may be achieved by use of antibiotics, hydrocortisone, etc.

At this stage thermo-cautery may be successful—the intention being to ignore the lesion and concentrate on the blood supply.

Procedure

The animal should be prepared, preferably with a general anaesthetic; in older patients the animal may be narcotised with a local anaesthetic using cocaine drops. A red-hot stilette is pressed lightly to the main vessels on the scleral side of the limbus. A simple but efficient instrument is a needle inserted into a wooden handle with the last eighth of an inch at the point bent at an angle of 45°, similar to the type used for preparing microscopical skin scrapings. Care should be taken to keep well clear of the cornea, otherwise opacity will occur over part or whole of its area. This is only a temporary condition but it needs some explaining to the owner.

Within 48 hours of removing the blood supply the granulation disappears and the cornea rapidly regains its transparency, leaving very little scarring. A considerable help to limiting the area of cautery is to flush the cornea with normal saline after application of the heated needle.

It is naturally wise to continue therapy with hydrocortisone, etc., after cautery until complete satisfaction is obtained.

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* One of a symposium of short papers presented to the Central Veterinary Society on March 7th, 1957, but not ready for publication on July 6th, 1957.

BILATERAL RENAL CALCULI AND PYELONEPHRITIS IN A SPANIEL

H. C. Wilson

Cupar, Fife

Subject: Spaniel bitch, 9 years.

History: Thirst and polyurea for some months, the owner complained of an objectionable odour having persisted during the same period. Anorexia had existed for two days with an increased thirst although the water drunk was vomited back. No diarrhoea or vaginal discharge was apparent. Oestrus had been regular and the latest had occurred four months previously.

Clinical Examination: Temperature 103.5° F. Heart and respiratory rate normal, pulse weak. The animal was obese and lethargic. The eyes were sunken with a bilateral ocular discharge although sclera and conjunctiva appeared normal. No nasal discharge or halitosis was observed.

The ears showed evidence of otitis externa.

Auscultation of the chest indicated no abnormality of the heart sound, although vesicular respirations were apparent.

Abdominal palpation failed to demonstrate any abnormality, regional lymph nodes were normal in size.

Diagnosis: Nephritis (confirmatory tests were not carried out).

Treatment: Sulphaguanidine and streptomycin* controlled diet.

Further Examination: No change 3 days later and euthanasia was advised.

Post-mortem Examination: The main findings were in the urinary tract. The *left* kidney was normal in size. On section the structure was macroscopically normal. The capsule stripped easily. The renal pelvis, however, contained a large calculus, size 1½" x ½" which almost exactly fitted the renal pelvis and entrance to the ureter (staghorn calculus). The left ureter was normal in size.

* Entavet: Allen and Hanburys Ltd.

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Current Literature

ABSTRACTS

Poisoning by Sodium Salt. A cause of eosinophilic Meningoencephalitis in swine. SMITH, A. L. T. (1957). *Amer. J. Vet. Res.* **69.** 825-50.

This condensed thesis for a Ph.D. degree shows that about 53 large-white pigs were subjected to salt-poisoning diets, with restricted water supply. In addition to an ordinary commercial basic ration, the animals were fed on such foods as salt fish, brine, degradation products of *A. lumbricoides*, and the ration plus pure common salt.

Symptoms of salt poisoning were set up, and these are described in great detail; they include shivering, treading, tenesmus, polydipsia, polyuria, pruritis, and hyperaesthesia, with a parchment-like condition of the skin, dehydration, incoordination of movement, and paralysis.

It was shown that salt poisoning can be produced in pigs by the addition of sodium chloride to the food, plus the control of water intake. The sodium ion and a body-fluid volume disturbance are reciprocal aetiological factors in the salt poisoning of pigs.

Symptoms of poisoning can be produced by the inclusion of as little as 2.5 per cent. sodium chloride fed in the swill, when water intake is restricted. Sodium propionate fed in a 4 per cent. concentration will also set up clinical symptoms of salt poisoning.

At *post mortem*, macroscopic lesions are non-specific, but microscopic changes in the cerebral cortex consist largely of oedema and eosinophilic meningoencephalitis with malacia. Sodium as well as chloride levels in the blood serum are valuable differential diagnostic aids. An eosinopenia accompanies the onset, and persists during the course of the disease. Recovery is signalled by an increase in the number of eosinophils. Blood-serum calcium levels are normal in pigs suffering from excessive intake of sodium salt.

The author obtained his Ph.D.

D. J. A.

The Use of Piperazines as Anthelmintics for Swine. ENZIE, F. D., *et al.* (1958). *Amer. J. Vet. Res.* **70.** 19-24.

The authors agree that piperazine compounds are safe and active against immature and mature *Ascaris lumbricoides* and *Oesophagostomum* spp. and are not dangerous to man, but they think it is difficult to ensure adequate intake of them when pigs are dosed in groups under field or farm conditions. The widely-accepted optimum dose of 50 mg. of piperazine per lb. bodyweight has been based on the dosing of individual pigs and, although this is effective, some workers quoted have found that piperazine is less effective when pigs are dosed in groups. To verify this, the authors compared the effects of piperazine adipate, citrate and sulphate, piperazine-1-carbodithioic acid, and a commercial mixture of piperazine dihydrochlorides given in food or water to pigs either individually or in groups of 2 to 4 pigs of mixed breeds 2 to 6 months old. Their preliminary results were given by Enzie, Colglazier, and Wilkins (1957) (*Vet. Med.* **52.** 331-6). Most of the pigs used had natural infections with *A. lumbricoides*, *Oesophagostomum* spp., *Hyostrongylus rubidus*, *Ascarops strongylina*, and *Trichuris trichiura*, but some were experimentally infected with *A. lumbricoides* and *Oesophagostomum*.

The authors conclude that piperazine is safe and reliable for the removal of *A. lumbricoides* and *Oesophagostomum* spp., from pigs, provided that the pigs consume at least 50 mg. of piperazine per lb. bodyweight within about 24 hours. But, when pigs are dosed in groups, this amount may not be taken in this time, because weaker pigs may fail to get it, or because the medicated water or food is not palatable, or because, when the drug is given in water, the normal water-intake of the pigs varies according to the season or the atmospheric temperature. Usually, in the small groups of pigs used, the compounds tested were less effective in one or two individuals. For group-dosing higher doses may be needed. Kelly *et al.* (1956) (*Vet. Med.* **51.** 97-101) obtained excellent results with 100 mg. of piperazine per lb. bodyweight.

More work is needed with larger groups of pigs and also on the palatability of the various piperazine compounds. Piperazine citrate seemed to be palatable and was apparently the most satisfactory compound tried. None of the preparations used had significant action on *H. rubidus*, *A. strongylina*, or *T. trichiura*. The full bibliography is valuable.

G. L.

(*Continued in second column, page* 426)

Bilateral Renal Calculi and Pyelonephritis—*Concluded.*

The *right* kidney was markedly enlarged with haemorrhagic areas on the surface. On section, the renal cortex contained several infarcts and the medulla and cortex contained numerous foci of suppuration. The capsule stripped easily. The renal pelvis was enlarged and thickened, and contained a small calculus $\frac{1}{2}''$ in diameter. The renal pelvis was dilated with urine which was opaque and yellow. The right ureter was slightly thickened.

The bladder was small and the walls hypertrophied. There were several ecchymotic haemorrhages on the internal surface. The urine was very opaque.

Laboratory Report: Oxalate + ; Urate + (trace); PO_4 + ; NH_4 + ; CA + ; MG + ; Cystine, neg.

Acknowledgment.—I am indebted to Mr. J. M. Hamilton of the Glasgow University Veterinary School, for the chemical analysis of the calculi.

The Royal Society of Health Congress

One of the most successful meetings yet held by the Veterinary Hygiene Section, took place at the 65th Royal Society of Health Congress, held at Eastbourne on April 30th. An audience of over 350 delegates, representing all branches of public health, were present; the most pleasing feature, from the organiser's point of view, was the attendance of a large number of members of the veterinary profession. The section met under the Presidency of Professor R. Lovell, Royal Veterinary College, London.

Before the afternoon's proceedings began, an informal meeting of veterinary surgeons was held at the home of Mr. and Mrs. R. Turnbull, Eastbourne. This meeting was arranged by the British Veterinary Association and among those present were Professor H. Burrow, Deputy Chairman R.S.H. Council, Professor L. P. Pugh, Professor A. Robertson, Mr. W. D. Macrae, Captain G. Atkinson, Messrs. J. King Shaw, G. S. Ferguson, G. C. Allen, J. M. Olivant, J. A. Pasfield, W. Tweed, W. Wilkins, and H. E. Bywater, and Dr. J. C. Greatorex (Recording Secretary). The President of the B.V.A., Mr. J. Ingram, welcomed those present and thanked Mr. and Mrs. Turnbull for their hospitality.

Professor Lovell opened the Session by delivering his Presidential Address entitled "The Relationship of Animal Production and Animal Diseases to Human Welfare." At the conclusion of his address Sir Weldon Dalrymple-Champneys spoke of the important work done by Professor Lovell in the field of veterinary bacteriology, and proposed a vote of thanks to him. It is hoped to publish a full summary in THE VETERINARY RECORD in due course.

The remainder of the veterinary programme took the form of a symposium, entitled "Some Lesser Known Diseases Common to Man and Animals," three papers being delivered:—

(a) "Bacterial Infections" by J. A. Boycott, M.A., D.M., M.R.C.S., L.R.C.P., Director, Public Health Laboratory (Medical Research Council), Taunton.

(b) "Virus Infections" by F. O. MacCallum, B.SC., M.D., L.M.S., Director, Virus Reference Laboratory, Central Public Health Laboratory (Medical Research Council).

(c) "Parasitic Infestations" by E. L. Taylor, C.B.E., D.V.SC., M.R.C.V.S., D.V.H., N.D.A., N.D.D., Deputy Director, Ministry of Agriculture Veterinary Laboratories, Weybridge.

All three papers were of high quality and were warmly received by the large audience.

The openers of the discussion were, respectively, Mr. W. Tweed, Divisional Veterinary Officer, Ministry of Agriculture; Dr. J. F. Warin, Medical Officer of Health, Oxford; and Mr. E. H. C. Wadhams, Chief Public Health Inspector, Witham U.D.C. Members of the profession who participated in the general discussion were Mr. J. King Shaw, Professor Pugh, Captain G. Atkinson, and Mr. J. A. Pasfield.

At the conclusion of the meeting Professor Lovell said it was evident, by the large attendance of members of the veterinary and allied public health professions, that the subject discussed was one of particular importance to all concerned with public health, and he thanked the principal speakers and those who had taken part in the discussion.

On May 2nd the Congress dinner was held, and among those present were Professor and Mrs. H. Burrow, Mr. and Mrs. J. M. Ingram, Professor and Mrs. Pugh. Captain and Mrs. Atkinson, and Dr. J. C. Greatorex.

ABSTRACTS—*Concluded.*

Metabolism of ^{59}Fe-Dextran Complex in Human Subjects. GRIMES, A. J., and HUTT, M. S. R. (1957). *Brit. med. J.*, November 9th, 1957. 1,074-7.

The introduction of an iron-dextran complex isotonic with tissue fluids and having a *p*H of 6 to 7 enabled intramuscular therapy to be established in the treatment of iron-deficiency anaemia.

The studies reported in this paper were designed to provide information as to the clearance from intramuscular sites and the percentage of iron utilised for haemoglobin synthesis in different circumstances.

A radioactive iron-dextran complex was prepared by incorporation of an isotope of iron (^{59}Fe) into a small process unit similar to that used in routine manufacture. The limited supply of radioactive iron-dextran and its decay rate necessitated the investigation of cases that happened to be available for studies lasting up to two weeks.

The radioactive iron-dextran was injected intravenously in 5 cases and intramuscularly in 5 cases. The object of intravenous injection was to follow the metabolic pathways of the material uncomplicated by its slow release from the temporary depot site produced by intramuscular injection. Following intravenous injection the compound is completely cleared by the reticulo-endothelial system, where the iron is rapidly liberated from the dextran complex and enters the labile iron pool, from which it passes to erythropoietic tissue, where it is utilised for haemoglobin synthesis. The utilisation of the iron injected intravenously appears to be virtually complete in iron-deficient subjects.

Following intramuscular administration a variable proportion of the dose is very rapidly absorbed, the remainder appearing to be fixed locally, or only slowly absorbed for periods up to 4 weeks. It appears that on the average approximately 60 per cent. of the dose injected intramuscularly was rapidly absorbed, and that in iron-deficient subjects the proportion absorbed was fully utilised for haemoglobin synthesis. Immobilisation of the patients in bed appeared to retard absorption of the iron-dextran complex injected intramuscularly.

G. F. B.

News and Comment

AN IMPORTANT DECISION

The B.V.A. was recently asked to support the case of a member who had made a claim under the Industrial Injuries Acts for benefits in consequence of contracting one of the scheduled diseases in the course of his employment.

While the Insurance Officer claimed that the member was not in an insurable form of employment which would bring him into risk of contacting TB., and was not, therefore, entitled to any benefits under the Acts, as a result of an appeal conducted through one of the Divisions, a local tribunal ruled that:—

"Claimant has proved that tuberculosis is a prescribed disease in relation to his employment as a veterinary surgeon, under subhead (d) of the schedule.

"He has had close and frequent contact with TB. cattle. This is ancillary to his work as a pathologist and *post-mortem* worker";

and the appeal was therefore allowed.

STUDY TOUR IN DENMARK

May we draw attention to the altered dates of this tour, as notified recently to the B.V.A. by the Danish Institute.

The new dates are: depart from Harwich September 6th, arrive back at Harwich September 19th.

IN PARLIAMENT

Tuberculosis Tests (Veterinary Surgeons)

SIR R. GRIMSTON (May 8th) asked the Minister of Agriculture what steps he takes to ensure that when veterinary officers who are not on the staff of his Department are instructed to carry out tests under the Tuberculosis (Attested Herds) Scheme, 1950, they are fully conversant with the terms of this scheme and of the financial provisions.

THE JOINT PARLIAMENTARY SECRETARY TO THE MINISTRY OF AGRICULTURE, FISHERIES AND FOOD (MR. J. B. GODBER): Veterinary surgeons in private practice who act as local veterinary inspectors on behalf of my Department are given general guidance on the provisions of the Tuberculosis (Attested Herds) Scheme, 1950. Their duties in this connexion are confined to the tuberculin testing of herds and do not extend to financial or administrative questions.

SIR R. GRIMSTON: Is my hon. Friend aware that in my constituency a certain veterinary surgeon was given instructions last September to postpone carrying out these tests owing to the incidence of foot-and-mouth disease and, subsequently, another constituent of mine whose cattle were due to be tested by that veterinary surgeon was refused the capitation grant because the tests were out of time? Does not my hon. Friend think that that is very unjust and should be reconsidered?

MR. GODBER: In reply to the first part of the supplementary question, I was not aware of that and will be happy to look into the point. The second case, of which I was aware, I have looked into. I do not think we can lay it down that these officers, who are private practitioners, shall be bound to inspect by a certain date, but I take the point made by my hon. Friend. My right hon. Friend is issuing a memorandum to these inspectors reminding them that only cattle which have passed the second, official, test by the statutory return date would qualify for capitation.

Cattle and Meat (Exports to Continent)

MR. HURD (May 8th) asked the Minister of Agriculture the average weekly number of cattle exported for slaughter on the Continent, and the amount of carcase meat exported to the Continent compared with a year ago; and to what extent these exports have qualified for subsidy.

MR. GODBER: February is the latest month for which reliable information is available. During January and February this year, about 2,000 head of cattle a week were exported to the Continent for slaughter as compared with about 3,000 head a week during the same period in 1957. This year not more than 10 per cent. of these exports were clean animals eligible for subsidy, whereas last year the proportion was estimated at 15 to 20 per cent. Exports of meat during the same periods were at the rate of some 360 tons a week this year as compared with 220 tons a week last year. It is impossible to say what proportion of this meat came from animals on which subsidy had been paid.

MR. CHAMPION: Does the hon. Gentleman attribute any of the fall in the export of live cattle to the restrictions rightly placed on the trade by the Minister?

MR. GODBER: There certainly was an initial reaction to that. The trade has grown again to some extent, but subject to the safeguards. I am grateful to the hon. Gentleman for the implication of his question. Those restrictions were right, and I am sure that that is the general feeling of the House.

Myxomatosis

MR. HURD asked the Minister of Agriculture to what extent myxomatosis exists now; and in which districts it is widespread in lethal form.

MR. GODBER: Myxomatosis is now present in 33 counties in England and one in Wales. In 13 English counties, the disease is fairly widespread, mainly in the lethal form, although instances of the attenuated strain of the disease are found side by side with the more virulent strain.

Cattle and Sheep (Export to Australia)

MR. BALDWIN (May 8th) asked the Minister of Agriculture whether he will make a statement on the progress of negotiations taking place with the Australian Government with regard to the reported threat of prohibition of imports of cattle and sheep from Great Britain owing to the fear of importing the disease known as blue tongue, a disease so far unknown in Great Britain.

XUM

MR. GODBER: As regards cattle, I would refer my hon. Friend to the reply given to my hon. Friend the Member for South Angus (Sir J. Duncan) on April 24th. We are still in touch with the Australian authorities. The import of sheep into Australia from the United Kingdom has been prohibited since 1952 on account of scrapie.

MR. BALDWIN: Since the Australians, apparently, are prohibiting or proposing to prohibit the importation of cattle from this country, not because we have blue tongue but because they are afraid of blue tongue, which, apparently, exists on the Continent, will my hon. Friend take steps to see that no live animal is imported from the Continent and, at the same time, let the Australians know what we are doing? Further, will he see to it that there is no back-door entrance of stock through the Republic of Eire?

PERSONAL

The President of the R.C.V.S., Mr. G. N. Gould, in his tour of the Caribbean has now arrived in Venezuela where he was received by the Minister of Agriculture, following which a luncheon was given in his honour by the British Ambassador. He is committed to an extensive programme of lectures, broadcasts, and conferences as well as visits to stock farms in various parts of the country.

Mr. Bruce V. Jones tendered his resignation as secretary at the recent annual general meeting of the Central Veterinary Society. He is to be succeeded by Mr. K. M. Dyce of the Royal Veterinary College.

Births

BARTON.—On April 17th, 1958, to Doris, wife of D. J. Barton, M.R.C.V.S., of Luton, Beds, a son, Simon John.

HAWKSLEY.—On May 2nd, 1958, at 82, Huntingdon Road, Cambridge, to Betty (*née* Nicholson), wife of Michael B. Hawksley, B.SC., M.R.C.V.S., a daughter, Karen Odette Louise, sister for Jane and Christopher.

LAWRENCE.—On May 2nd, 1958, to Heather, wife of Brian T. Lawrence, M.R.C.V.S., of 18, Eastwood Road, Goodmayes, Essex, a son, Simon John.

SPENCE.—On May 11th, 1958, at 33, Leys Road, Cambridge, to Elizabeth, wife of J. B. Spence, B.SC., M.R.C.V.S., a son, Iain Douglas, a brother for Martin.

Engagement

HARDWICK—ALLAN-SMITH.—The engagement is announced between Anthony Hardwick, M.R.C.V.S., son of Dr. and Mrs. R. H. Hardwick, of Uplands, Headcorn, Kent, and Penelope, daughter of Mr. and Mrs. Neville Allan-Smith, of 75, Chester Square, London, S.W.1.

R.C.V.S. OBITUARY

We record with regret the death of the following member of the profession:—

RAE, John, D.S.O., 60, Larchfield Avenue, Newton Mearns, Renfrewshire, Major late R.A.V.C.(M.). Graduated May 21st, 1908, at Glasgow Veterinary College. Died May 4th, 1958, aged 71 years.

Supplementary Veterinary Register

HURLE, Eric Francis, P.D.S.A., 59, Corporation Road, Middlesbrough, Yorks. Died May 10th, 1958, aged 56 years.

R.C.V.S COUNCIL ELECTION

The Registrar would remind those members who have not yet voted that voting papers must be returned to him so as to be received on or before *Tuesday, May 27th, 1958.*

R.C.V.S. DAY

Members of the profession are reminded that they should make early application for reservations for themselves and their wives and friends for the various functions on June 11th. The Service in the Queen's Chapel of the Savoy at 11.45 a.m. The Luncheon at the Savoy Hotel at 12.30 p.m. for 1 p.m. The Annual General Meeting and tea at the College at 3.45 p.m.

UNIVERSITY NEWS

Cambridge

DOCTORATES CONFERRED

At a Congregation held on April 26th the degree of Ph.D. was conferred on P. Whittlestone and A. C. Palmer. The title of Dr. Whittlestone's thesis was "Enzootic pneumonia of pigs and related conditions," and that of Dr. Palmer "The nature of the vacuolation and the distribution of affected neurones in sheep suffering from scrapie."

THE REGISTER OF VETERINARY SURGEONS

Under the provisions of Section 25 (4) of the Veterinary Surgeons Act, 1948, and S.I.1729 of 1957, the name of Mr. Madhu Sudan Das, Bengal Veterinary College, Calcutta, 37, India, was restored to the Register of Veterinary Surgeons on May 9th, 1958.

ROYAL COLLEGE OF VETERINARY SURGEONS PHARMACOLOGY EXAMINATION

List of Successful Candidates, May, 1958

Dublin

Hand, Patrick, J., Marray, E. A., O'Driscoll, T. L.

COMING EVENTS

May

20th (Tues.). Spring Meeting of the Eastern Counties Veterinary Society at the Duke's Head Hotel, King's Lynn, 12 noon.

21st (Wed.). Meeting of the Section of Comparative Medicine, Royal Society of Medicine, at the Society's House, 5 p.m.

Meeting of the Warwickshire Veterinary Club at the Regent Hotel, Leamington Spa, 8 p.m.

22nd (Thurs.). Annual General Meeting of the Essex Veterinary Society at the Saracen's Head Hotel, Chelmsford, 7.30 p.m.

Annual General Meeting of the Midland Counties Veterinary Association at the Birmingham Medical Institute, 36, Harborne Road, Birmingham, 15, 2.30 p.m.

Annual General Meeting of the Herts and Beds Veterinary Society at the George Hotel, Luton, 7.30 p.m.

Annual General Meeting of the Dumfries and Galloway Division in the Station Hotel, Dumfries, 2 p.m.

24th (Sat.). One-day Horse Trials at Burgh House, Miltonbridge, Nr. Edinburgh, to be held by the Horse Society, Royal (Dick) School of Veterinary Studies.

28th (Wed.). Annual General Meeting of the Southern Counties Veterinary Society at the Red Lion Hotel, Salisbury, 7 p.m.

29th (Thurs.). Meeting of the Ayrshire Veterinary Association in the Station Hotel, Ayr, 2.30 p.m.

30th (Fri.). Ordinary General Meeting of the Royal Counties Veterinary Association in the Village Hall, Compton, 2.30 p.m.

31st (Sat.). Meeting of the B.S.A.V.A. Southern Region at the Royal Hotel, Winchester, 7.30 p.m.

June

4th (Wed.). 16th Annual General Meeting of the Society of Women Veterinary Surgeons at the Meeting Hall of the Zoological Society of London, Regent's Park, N.W.1, 2.30 p.m.

6th (Fri.). Annual Dinner and Reunion of the Royal Veterinary College Association at the Royal Veterinary College, Camden Town, 6.30 for 7 p.m.

11th (Wed.). 115th Annual General Meeting of the Royal College of Veterinary Surgeons at 10, Red Lion Square, London, W.C.1, 3.45 p.m.

Annual General Meeting of the Victoria Veterinary Benevolent Fund at 10, Red Lion Square, W.C.1, 10.15 a.m.

Meeting of the North Wales Division at Bryn Adda, Dolgellau, 2 p.m.

12th (Thurs.). Annual Meeting of the R.A.V.C. Golfing Society at the North Hants Golf Club, Fleet, 10 a.m.

20th (Fri.). Meeting of the Society for the Study of Animal Breeding at Lyndhurst, Hants.

25th (Wed.). Summer Meeting of the Herts and Beds Veterinary Society.

September

21st to 26th (Official Opening, Monday, September 22nd). 76th Annual Congress of the British Veterinary Association in Douglas, Isle of Man.

BRITISH VETERINARY ASSOCIATION QUARTERLY MEETINGS IN LONDON

Wednesday, July 9th—No. 7, Mansfield Street

10.00 a.m. Veterinary State Medicine Committee.
11.30 a.m. Parliamentary and Public Relations Committee.
2.00 p.m. Finance Sub-committee.
3.45 p.m. Home Appointments Committee.

Thursday, July 10th—No. 7, Mansfield Street

9.30 a.m. Small-Animals Committee.
11.30 a.m. Farm Livestock Committee.
2.15 p.m. General Purposes and Finance Committee.

Friday, July 11th—Connaught Rooms, Gt. Queen Street, W.C.2

10.15 a.m. Council.

ADDRESSES OF DISEASE INFECTED PREMISES

The list given below indicates, first the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

Anthrax

Kirkcudbright. Whitecroft, Dalbeattie (May 7).

Northants. Ashton Meadow, Herne Farm, Oundle, Peterborough (May 6); Chester Farm, Wellingborough (May 7).

Wilts. Turnpike Farm, Heddington, Calne (May 6).

Yorks. Craven Ridge Farm, Giggleswick, Settle (May 2).

Fowl Pest

Herts. 14, Baldock Street, Ware (May 6).

Lancs. Brookside Farm, St. Michaels-on-Wyre, Preston (May 7).

Sussex. Horton Hall Farm, Small Dole, Henfield; Gayney, Old Shoreham Road, Lancing (May 8).

Swine Fever

Bucks. Brickyard Farm, Gt. Horwood Road, Winslow (May 8).

Caerns. Hendre Bach, Hendryd, Conway (May 7).

Ches. Forge Mill Farm, Warmingham, Middlewich (May 6); Deva Farm, Deva Hospital, Upton by Chester (May 7).

Denbigh. Hillberry, Bradley, Wrexham (May 5).

Derbys. Lane Farm, Newbold, Chesterfield (May 7).

Devon. Claypitts Farm, East Hill, Ottery St. Mary (May 6).

Dorset. Thurnwood Farm, Mappowder, Sturminster Newton (May 5).

Gloucs. Chesley Hill, Bridgeyage, Warmely, Kingswood, Bristol (May 6).

Norfolk. Fen Street, Lower Stow Bedon, Attleborough (May 5).

Oxford. Moorcroft, Cassington (May 2).

Salop. Osbourne House, Ellesmere (May 2).

Somerset. Cowpool Farm, Clifton Maybank, Yeovil (May 2); Windmill Farm, Montacute (May 6).

Suffolk. America Farm, Combs, Stowmarket (May 7).

Sussex. Five Acres Farm, Dowlands Farm, Copthorne, Crawley (May 6).

Warwicks. 62, Fords Road, Majors Green, Shirley, Solihull (May 2); 24, The Long Shoot, Nuneaton (May 5).

Worcs. Mill Farm, Childswickham, Broadway (May 5).

Letters to the Editor

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the B.V.A.

Anaesthesia and Narcosis in the Horse

Sir,—I would like to congratulate Professor Wright on his recently published lecture on anaesthesia in the horse, but particularly on that part of it in which he describes the virtues of chloral hydrate and traces the history of its use for a period of 80 years. He mentions its successful use by several well remembered officers of the R.A.V.C. during the First World War, even though they chose the difficult and sometimes hazardous method of doing so.

During the Second World War an occasion arose to use anaesthesia in a rather big way and one which may carry Professor Wright's historical story a little further.

At a time when I was D.D.V.S. Central Command, India, in which practically all the units for the Burma campaign were raised and trained, I was approached by Major-General Wingate's second-in-command in connexion with a problem of great urgency. This was to devise a method of silencing the braying and whinnying of the animals for the new and greatly enlarged Second Force then collecting. The experience of the First Force showed that this had seriously inhibited operations close to the enemy and was damaging for morale. I told him that the only possible and practical solution would be excision of the vocal chords and that this could, I thought, be quickly verified. The following morning I operated successfully on 3 old mules, using chloroform. I found that as I used glasses my vision was considerably interfered with by the fine spray of blood which quickly covered them owing to the greatly increased force and rapidity of respiration through the opening in the larynx. Later, when demonstrating the operation to officers selected to carry it out on a large scale, I used chloral hydrate intravenously and experienced no interference from the tranquil respiration encountered. As there was some doubt about the availability of chloroform for use on a large scale, it was decided to use chloral hydrate and about 1,500 animals were, at short notice, muted for immediate use by Wingate's new brigades. Considerably greater numbers were done at a later date for use as replacements. These operations were not devoid of unfortunate incident as, for example, when several unusual cases of what proved to be delayed action jugular phlebitis were found in one unit. The cause of this was traced to the slipping of the casting rope round the neck which resulted in unnoticed pressure on the vein and leaking into the tissues of a mixture of blood and chloral hydrate through the needle puncture. These were successfully treated by surgical methods. In a very few cases where the drug was deposited outside the vein the swelling was immediately opened and the tissues extensively scarified, massaged, and washed with saline, with successful results.

The dose of chloral hydrate was regulated by the size of the animal and the short duration of the anaesthesia required, 4 drachms in 8 oz. of water was sufficient for a small mule, the maximum dose being 1 oz. in 16 oz. water.

These early operations were carried out under camp conditions and in monsoon weather and, considering that practically all the animals had been purchased unbroken in the Argentine and S. Africa, where examinations of the heart may not have been practical, the death rate from all causes was reasonable, being well under 1 per cent.

Yours faithfully,
C. M. STEWART.

Dowdstown House,
Maynooth,
Co. Kildare.
April 26th, 1958.

Kennel Club Ruling on Entire Dogs

Sir,—May I draw the attention of members, particularly those engaged in practice, to the extract of the Kennel Club Regulations published in THE VETERINARY RECORD dated May 3rd? Unfortunately there are dog owners anxious to have their abnormal animals operated on with the obvious intention of deceiving the Kennel Club, show judges, and veterinary surgeons officiating at shows. It is even more regrettable that there are veterinary surgeons willing to perform these operations, perhaps without realising the implications of their action.

The profession, through the British Veterinary Association, has campaigned for many years to have the condition of monorchidism and cryptorchidism recognised by the Kennel Club as a serious defect. Now that these efforts have been successful all our members should play their part and refuse to perform the operations on these animals.

Yours faithfully,
THOMAS C. DENHOLM.

Clinton House,
84, Burton Road,
Carlton,
Nottingham.
May 4th, 1958.

Measurement of Horses

Sir,—In THE RECORD of March 29th I read with astonishment Mr. D. V. Sinclair's letter on "Measurement of Horses."

No one would measure a horse after a weight had been on its back for some time. I was taught, and have always practised, that one should get a horse from the stable, or horse lines, and make it stand on a level surface such as a concrete pavement. The measure stick is then placed perpendicularly and *in line with the back tendons*. Wherever the cross-bar —with the spirit level—crosses the withers there is the correct height.

The matter of shoes can then be examined, but what I cannot understand is Mr. Sinclair's statement that "the height of a horse is traditionally measured at the highest point of the withers." This would be difficult, for example, in a Clydesdale stallion with his big crest, if one did not have the guiding principle of the line of the tendons.

Yours faithfully,
A. MATTHEW.

P.O. Box 42,
Fort Beaufort, C.P.,
S. Africa.
April 26th, 1958.

Jaundice in Housed Sheep

Sir,—I have read Mr. Bracewell's article on jaundice in housed sheep (*Vet. Rec.* **70.** 342-4) with considerable interest.

The description of the management, clinical features, histology, and *post-mortem* findings resemble closely those described in an outbreak of copper poisoning which killed 7 out of 15 rams (*Vet. Rec.* **68.** 332-3). These losses were associated with the unnecessary addition of copper in a mineral supplement. A leading firm of mineral feed manufacturers ceased to add copper to their mineral mixture, recommended for sheep other than hill sheep, after the recording of this outbreak. The deaths were not associated with any drastic change of management, but the rams had been receiving a similar concentrate mixture to the one described in Mr. Bracewell's article.

The feeding of these concentrate mixtures may be an important factor in the build-up of liver copper values.

Yours faithfully,
F. G. CLEGG.

Ministry of Agriculture, Fisheries and Food,
Veterinary Investigation Centre,
School of Agriculture,
Sutton Bonington,
Loughborough,
Leicestershire.
April 25th, 1958.

Ring Womb in Sheep

Sir,—I do not wish to open a further lengthy discussion on this matter but I should like to draw attention to a letter in the *New Zealand Veterinary Journal*, Malone (1957), describing an alternative technique to delivery by caesarean section. I quote:—

Method. "The finger is inserted into the cervix and, by gentle traction, the vagina is completely everted. The cervix is held out in this position by two tissue forceps applied laterally. Straight-bladed scissors are then used to cut forward through the cervix, vagina, and a small part of the uterus on the dorsal aspect. There is now an ample opening to remove the lamb. If the membranes do not come away, the uterus is completely everted and they are removed manually. The uterus is then replaced, the incision sutured, and the vagina returned. No anaesthetic is necessary and little discomfort appears to be suffered by the ewe. I have found the results to be uniformly successful."

I have carried out this procedure on 4 ewes this year with 50 per cent. maternal mortality and 100 per cent. foetal mortality. Delivery of the lambs was very difficult in the two ewes which died and there was severe bruising of the vagina and cervix. For 48 hours they appeared to progress and then severe inflammation at the site of incision occurred, and following 24 hours of stiffness, straining, etc., death occurred from vaginal and uterine sepsis. All cases were given penicillin and antitetanin at the time of operation and a further dose of penicillin the following day. The procedure is quick and relatively easy, and with practice might be a useful method of approaching this condition. A large incision is essential, but even then eversion of the uterus is very difficult.

It is interesting that all lambs were either born dead or died within hours of delivery. I have thought for some time that the condition of ring womb was more common in the early part of the lambing season or when "tegs" begin to lamb. Often the owner has informed me that lambing should not have commenced in his flock for 7 to 10 days and this opinion has been supported by the ewes' shortage of milk. It could be that ring womb is associated with abortion, and that the reason for the high foetal mortality in the 4 cases mentioned, and in many of my previous caesareans, is because the lambs were not full term.

Yours faithfully,
RICHARD H. C. PENNY.

Black Lion Yard,
High Street,
Leighton Buzzard.
May 6th, 1958.

A Plea

Sir,—I wish to support wholeheartedly Mr. Miller's plea for a better standard of English in our scientific journals. It has long been the contention of the arts professions that such a standard is very low, and it is heartening to find such an eminent veterinary surgeon as Mr. Miller drawing attention to it. Scientific contributions do not have to be works of art, but they should make some effort to preserve the beauty of the English language.

At the Congress last year I was surprised to hear so many members congratulate the speaker "on his very excellent paper," a qualification that would make a fourth-former wince. Fortunately, the editor of THE VETERINARY RECORD knew better, and did not print it.

I cannot, however, support the letter following, from Mr. Geffen. As it is, there are far too many members of the medical profession masquerading as doctors. Let the title be restricted to those who have earned it.

BRIAN WICKS.

New Farm,
Corsham,
Wilts.
May 2nd, 1958.

A Scale of Veterinary Fees

Sir,—Once again there has appeared in your columns a letter from a correspondent interested in a scale of veterinary fees. Mr. Harrison is to be complimented on having drawn up the summary of a scheme whereby this may be achieved.

There is little doubt that such a scheme has a very wide appeal to many members engaged in general practice, particularly those with a mainly agricultural bias.

It appears to me that, in general, we are inclined to be somewhat complacent about our past achievements, and to spend altogether too little time in attempting to forecast the future. That costings are considerably disturbing the agricultural economists generally can hardly be denied, and inevitably the veterinary profession is, and will be, extensively reviewed by these gentlemen.

I would submit that now is the time to put our own house in order before others do it for us. Such a scale of fees is the most desirable beginning to a number of fundamental changes that the practitioner must achieve in the very near future if he is to continue to be allowed to assist the agricultural industry.

Yours faithfully,
A. D. SELF.

Coggeshall Road,
Braintree.
May 4th, 1958.

Sir,—Whilst I do not wish to start, or enter into, a lengthy discussion in the correspondence columns of THE RECORD, as this is a private matter between veterinary surgeons, I have been quietly campaigning for some years for the B.V.A. to produce a scale of suggested minimum charges. This could be on the lines of "The Guide to Professional Conduct" issued by the R.C.V.S. which should, along with other ethical matters, contain advice on charges.

So far I have made little progress, and Mr. Harrison's letter in THE RECORD for May 3rd is, in my opinion, a step in the right direction. He certainly deserves the support of practising veterinary surgeons and should get that of the younger members of the profession.

Yours faithfully,
RICHARD H. C. PENNY.

Black Lion Yard,
High Street,
Leighton Buzzard.
May 6th, 1958.

IN A LIGHTER VEIN

"Doctor" or "Mister"

Sir,—Accustomed as we are in this service to a variety of names from "our public," the perennial controversy over "Vet.," Veterinary Surgeon, or Doctor leaves us cold. But following the receipt of three dead hens labelled:—

"Veteran Animal Officer,
Department of Theology,
Milton Road,
Cambridge,"

may we yet hope to be addressed Venerable Reverend Sir?

Yours faithfully,
STAFF OF
VETERINARY INVESTIGATION CENTRE.
Ministry of Agriculture, Fisheries and Food,
Veterinary Investigation Centre,
Institute of Animal Pathology,
Milton Road,
Cambridge.
May 13th, 1958.

Sir,—In the May issue of *Family Doctor* is an advertisement recommending a booklet entitled "More Fun With Your Food." It tells that the publication will be available in grocers' and other food shops, price 1s., on May 19th next.

To encourage purchase the publisher records that the booklet is "Vetted by . . . Doctors." The converse, of course, would be "doctored by vets."!

Yours faithfully,
L. PITCHER.

66, Coningsby Road,
High Wycombe.
May 14th, 1958.

REPRINTS

An increasing number of requests for reprints, especially from overseas readers, is being made to the editorial office of THE RECORD. Will readers kindly note that we keep no stocks of reprints, and that enquiries for these should be made directly to the authors of the papers concerned.

ADVERTISERS' ANNOUNCEMENTS

THE DISTILLERS COMPANY (BIOCHEMICALS) LIMITED announces the availability of two new veterinary packs.

"Distavone" 4.5 Veterinary.—Each vial contains 500,000 units potassium penicillin G, 1,500,000 units procaine penicillin G, and 2.5 grammes dihydrostreptomycin sulphate. The synergistic action of this combination gives an increased effect against susceptible organisms.

"Distivit" B_{12} Veterinary.—A new size of this product has been introduced, namely, a 30-ml. vial containing 250 micrograms of vitamin B_{12} per ml. Flexibility in choice of dosage at economical levels is now possible with the new multi-dose vial.

The prices for the new packs and further information may be obtained from the Veterinary Department, The Distillers Company (Biochemicals) Limited, Broadway House, The Broadway, Wimbledon, London, S.W.19. Telephone: Liberty 6600.

MESSRS. MERCK SHARP & DOHME announce the availability of "HEPZIDE" (nithiazide) (1-ethyl-3-(5-nitro-2-thiazolyl) urea) for the treatment and prevention of blackhead in turkeys. "HEPZIDE" Soluble, for the medication of drinking water, is available in 4- and 20-sachet cartons: each sachet is sufficient to medicate 1 gallon of drinking water. "HEPZIDE" Insoluble Premix is available in 27-*oz.* drums, sufficient to medicate 1 ton of feed at the preventive level (0.015 per cent.). "HEPZIDE" is claimed to have a high potency combined with low toxicity, palatability, and rapidity of action.